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PATENT ABSTRACTS OF JAPAN

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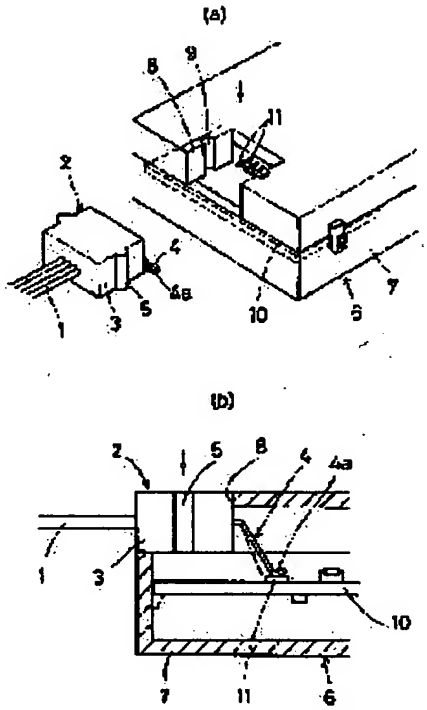
(71)Applicant : SUMITOMO ELECTRIC IND LTD
SUMITOMO WIRING SYST LTD
(72)Inventor : OKAMURA NORITOMO

(54) CONNECTOR FOR ELECTRONIC UNIT

(57)Abstract:
PURPOSE: To eliminate any unnecessary connections from an electrical connection between an electronic unit and wire harness.
CONSTITUTION: A male connector 2 having a pressure-contact type terminal 4 is provided at the end of wire harness 1. A female connector into which the male connector 2 is fitted comprises a socket 8 provided in the case 7 of an electronic unit 6 and electrode pads 11 located on a case-in circuit board 10, eliminating any special housing and terminals. When the terminal 4 is thus directly pressed into contact with the electrode pads 11, an electrical connection can be achieved by a single connector, and the need for connecting the electrode pads to the terminal is eliminated.



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CLAIMS

[Claim(s)]
[Claim 1] The connector for electronic units to which it is made for the terminal of a male connector to have contacted the polar zone on said circuit board in the location which it consists [location] of the male connector prepared in a wire harness edge, and the female connector to which fitting of this male connector is carried out, consists of [location] a connector receiving window which said female connector penetrated and prepares in the case of an electronic unit, and polar zone prepared on the circuit board within said case, and carried out fitting of the male connector to said connector receiving window.
[Claim 2] The connector for electronic units according to claim 1 used as the terminal of the pressure-welding mold which forms the maintenance means of both fitting condition in a male connector and a female connector, carries out elastic deformation of the terminal of a male connector further at the insertion terminal point of the male connector to a connector receiving window, and is pressed against said polar zone.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the connector for electronic units to which it closed performing electrical connection of an electronic unit and wire harness cheaply simple if .
[0002]
[Description of the Prior Art] When connecting the wire harness for an electric power supply or signal electrical transmission to the electronic unit constituted by storing the circuit board after electronic-parts mounting in a case, the connector of a sex pair is used in many cases.
[0003] As shown in drawing 5 (b), a male connector 20 and a female connector 30 form terminals 22 and 32 in housing 21 and 31, and are constituted, and the connector of a pair of is attached in the circuit board 10 within a case 7 as one side shows drawing 5 (a). Thus, one connector is prepared in an electronic unit side, the connector of another side is attached in wire harness 1 edge, and it is made to carry out fitting of the both.
[0004]
[Problem(s) to be Solved by the Invention] In the conventional continuation mentioned above, the male and the connector of two Metz to which each changes from housing and a terminal are required, and cost costs dearly. Moreover, since it is necessary to attach one connector in the circuit board within a case, and to connect the terminal of the connector to the circuit on a substrate further, an activity man day also increases. Furthermore, after mounting the connector attached in the circuit board in a substrate, it needs the housing ingredient of the high thermal resistance in that (16 of drawing 5 (a) is the soldering section) which lets it pass at a reflow furnace and solders a terminal, and becomes still more disadvantageous in respect of cost.
[0005] The technical problem of this invention is to abolish faults, such as this.
[0006]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem, in this invention, the female connector was constituted from a connector receiving window penetrated and prepared in the case of an electronic unit, and polar zone prepared on the circuit board within said case, and the terminal of a male connector made this female connector and the male connector prepared in a wire harness edge the structure of contacting the polar zone on said circuit board in the location which carried out fitting of the male connector to combination and said connector receiving window.
[0007] In addition, the terminal of a male connector has the desirable terminal of the pressure-welding mold which carries out elastic deformation at the insertion terminal point of the male connector to a connector receiving window, and is pressed against said polar zone. Moreover, in using this pressure-welding type of terminal, it establishes a means to hold the fitting condition of a male and Metz both connectors so that a male connector may not separate from a receiving window in the elastic stability of a terminal.
[0008]
[Function] Since the connector of this invention carries out fitting of the male connector for the connector receiving window prepared in the case of an electronic unit as an alternative of housing and connects the terminal of a male connector with the polar zone on the circuit board directly under this condition, the female connector of the item which consists of housing which was being used conventionally and a terminal

becomes unnecessary, and connection cost falls.
[0009] Moreover, it becomes unnecessary to connect the polar zone of the circuit board to a terminal in advance, and also becomes the simplification of connection, and reduction of an activity man day. In addition, the terminal of a pressure-welding mold has effectiveness in reduction of contact resistance.
[0010]
[Example] An example of the connector of this invention is shown in drawing 1 . As for the male connector which attached 1 of drawing in wire harness and attached 2 in the harness edge, and 3, housing of a male connector and 4 are the terminals of a male connector. the elastic stability which a terminal 4 makes a root side crooked downward, makes carry out elastic deformation of this flection, and is produced into that part -- curvature bending section 4a at a tip -- a partner -- it is made to have pressed against the conductor Moreover, the protruding line 5 prolonged in longitude is formed in the both-sides side of housing 3.
[0011] 6 is an electronic unit which contains the circuit board 10 and is constituted in a case 7. The receiving window 8 which inserts a male connector 2 is formed in the case 7 of this electronic unit. It has penetrated inside a case and the receiving window 8 has the electrode pad 11 formed in the circuit edge on the circuit board near the receiving window 8. Moreover, the fluting 9 used as the insertion guide of a protruding line 5 is formed in the receiving window 8.
[0012] He presses a male connector 2 fit in a receiving window, and is trying to fix to a fitting terminal point by giving an interference to the fluting 9 here. Although simple-ization of the configuration of a receiving window 8 and housing 3 will be attained if it is immobilization by this press fit, the maintenance means of a fitting condition may be a slot which stops a nonreturn pawl and it.
[0013] The female connector is constituted by the receiving window 8 and the electrode pad 11, and the connector of illustration presses a male connector 2 fit in a receiving window 8, as shown in drawing 1 (b). A pressure welding is carried out to the electrode pad 11 on the circuit board 10 by the elastic stability which a terminal 4 is pushed up for a while in the middle of this press fit in the circuit board 10 at a press fit terminal point, and the tip of a terminal 4 produces in the flection of a root, and the electrical connection of wire harness 1 and a substrate top circuit is completed.
[0014] In addition, although housing 3 is attached in mold-type housing which lays a terminal 4 underground, and housing which fabricated in advance the terminal attached in the wire harness edge, it may be whichever. Drawing 2 and drawing 3 are the male connectors which used housing of the latter type, and the housing 3 with a lance (returning) is equipped with it of drawing 2 through the terminal 4 of a wire harness edge at the hole of housing, it escapes from and carries out a stop by the lance 12, and is carrying out bending of the terminal 4 after wearing. Moreover, as the slot of a housing mating face pinched the terminal 4 of the male connector shown in drawing 3 after bending, it has equipped the housing 3 of an assembled die with it. In addition, although the doubling condition of housing carried out for 2 minutes was held in drawing 3 according to the simple lock device which consists of the pawl 14 which engages with the piece 13 of an elastic stop, and its piece of a stop, housing divided into two is welding, adhesion, etc., and may be unified. Moreover, handling is easy, if the division object is connected with the hinge 15 as shown in drawing 4 .
[0015]
[Effect of the Invention] As stated above, since the connector of this invention excluded the female connector of the item which constitutes a female connector from a case of an electronic unit, and an electrode on the circuit board, and consists of housing and a terminal, it can aim at reduction of cost.
[0016] Moreover, since the terminal of a male connector is directly contacted to the electrode on the circuit board, the electrical connection by soldering of an electrode and a connector terminal also becomes unnecessary, and there is effectiveness in the simplification of connection, improvement in working capacity, etc.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] (a): The perspective view in which changing an example of the connector of this invention into the condition of having solved association, and showing it
(b): The sectional view of the integrated state of a connector same as the above
[Drawing 2] The sectional view showing other examples of a male connector
[Drawing 3] The division perspective view showing other examples of a male connector
[Drawing 4] The perspective view showing other examples of housing
[Drawing 5] (a): The sectional view showing the conventional example of electrical connection
(b): The sectional view of a connector used for the connection same as the above
[Description of Notations]
1 Wire Harness
2 Male Connector
3 Housing
4 Terminal
4a Curvature bending section
5 Protruding Line
6 Electronic Unit
7 Case
8 Receiving Window
9 Fluting
10 Circuit Board
11 Electrode Pad
12 Lance
13 Piece of Elastic Stop
14 Pawl
15 Hinge
20 Male Connector
30 Female Connector
21 31 Housing
22 32 Terminal

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(71)出願人　000002130
住友電気工業株式会社
大阪府大阪市中央区北浜四丁目５番33号

(71)出願人　000183406
住友電装株式会社
三重県四日市市西末広町１番14号

(72)発明者　岡村　憲知
大阪市此花区島屋一丁目１番３号　住友電気工業株式会社大阪製作所内

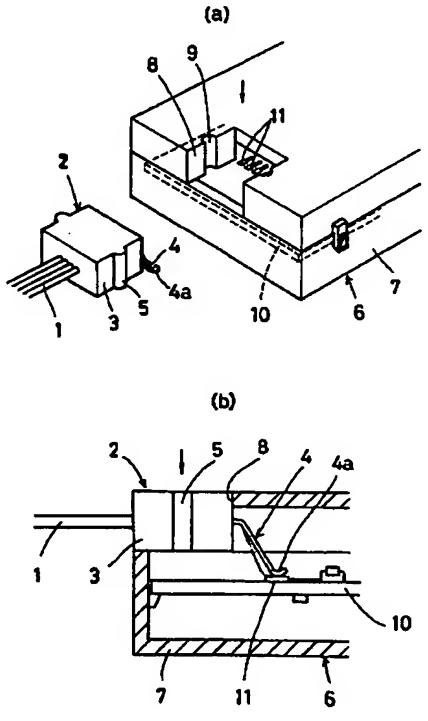
(74)代理人　弁理士　鎌田　文二　（外２名）

(54)【発明の名称】　電子ユニット用コネクタ

(57)【要約】

【目的】　電子ユニットとワイヤーハーネスの電気接続を、無駄な結線を省いて低コストで行えるコネクタの提供。

【構成】　ワイヤーハーネス１の端部に圧接型の端子４をもつオスコネクタ２を設ける。また、このオスコネクタ２を嵌合させるメスコネクタは、電子ユニット６のケース７に設ける受け口８とケース内回路基板１０上の電極パッド１１とで構成し、専用のハウジングと端子を省く。このようにして端子４を電極パッド１１に直接圧接させると単品のコネクタは１個でよく、電極パッドを端子につなぐ必要もなくなる。



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【特許請求の範囲】

【請求項１】　ワイヤーハーネス端に設けるオスコネクタと、このオスコネクタを嵌合させるメスコネクタとから成り、前記メスコネクタが電子ユニットのケースに貫通して設けるコネクタ受け口と、前記ケース内の回路基板上に設ける電極部とで構成され、前記コネクタ受け口にオスコネクタを嵌合させた位置でオスコネクタの端子が前記回路基板上の電極部に接触するようにしてある電子ユニット用コネクタ。

【請求項２】　オスコネクタとメスコネクタに両者の嵌合状態の保持手段を設け、さらに、オスコネクタの端子を、コネクタ受け口に対するオスコネクタの挿入終点で弾性変形して前記電極部に押し当てられる圧接型の端子にした請求項１記載の電子ユニット用コネクタ。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、電子ユニットとワイヤーハーネスの電気接続を簡便に、安価に行うことを可能ならしめた電子ユニット用のコネクタに関する。

【０００２】

【従来の技術】電子部品実装後の回路基板をケースに収めて構成される電子ユニットに電力供給、或いは信号電送のためのワイヤーハーネスを接続する場合、雌雄一対のコネクタを用いることが多い。

【０００３】その対のコネクタは、図５（ｂ）に示すように、オスコネクタ２０、メスコネクタ３０とも、ハウジング２１、３１内に端子２２、３２を設けて構成されており、一方が図５（ａ）に示すように、ケース７内の回路基板１０に取付けられる。このように、一方のコネクタを電子ユニット側に設け、他方のコネクタをワイヤーハーネス１端に取付けてその両者を嵌合させるようにしている。

【０００４】

【発明が解決しようとする課題】上述した従来の接続法では、それぞれがハウジングと端子から成るオス、メス２つのコネクタが必要であり、コストが高くつく。また、ケース内の回路基板に一方のコネクタを取付け、さらにそのコネクタの端子を基板上の回路に接続する必要があるので、作業工数も多くなる。さらに、回路基板に取付けるコネクタは、基板に実装した後、リフロー炉に通して端子を半田付けする（図５（ａ）の１６が半田付け部）ので高耐熱性のハウジング材料を必要とし、コスト面で更に不利になる。

【０００５】本発明の課題は、これ等の不具合を無くすことにある。

【０００６】

【課題を解決するための手段】上記の課題を解決するため、本発明においては、電子ユニットのケースに貫通して設けるコネクタ受け口と、前記ケース内の回路基板上に設ける電極部とでメスコネクタを構成し、このメスコネクタとワイヤーハーネス端に設けるオスコネクタを組合せ、前記コネクタ受け口にオスコネクタを嵌合させた位置でオスコネクタの端子が前記回路基板上の電極部に接触する構造にした。

【０００７】なお、オスコネクタの端子は、コネクタ受け口に対するオスコネクタの挿入終点で弾性変形して前記電極部に押し当てられる圧接型の端子が望ましい。また、この圧接型の端子を用いる場合には、端子の弾性復元力でオスコネクタが受け口から外れないように、オス、メス両コネクタの嵌合状態を保持する手段を設けておく。

【０００８】

【作用】本発明のコネクタは、電子ユニットのケースに設けたコネクタ受け口をハウジングの代替物としてオスコネクタを嵌合させ、この状態下で回路基板上の電極部にオスコネクタの端子を直接つなぐので、従来使用していたハウジングと端子からなる単品のメスコネクタが不要になり、接続コストが下がる。

【０００９】また、回路基板の電極部を事前に端子に接続しておく必要がなくなり、結線の簡素化、作業工数の削減にもなる。なお、圧接型の端子は接触抵抗の低減に効果がある。

【００１０】

【実施例】図１に、本発明のコネクターの一例を示す。図の１はワイヤーハーネス、２はそのハーネス端に取付けたオスコネクタ、３はオスコネクタのハウジング、４はオスコネクタの端子である。端子４は根元側を下向きに屈曲させてこの屈曲部を弾性変形させ、その部分に生じる弾性復元力で先端の反り曲げ部４ａを相手導体に押し当てるようにしてある。また、ハウジング３の両側面には縦向きに延びる突条５を設けてある。

【００１１】６は、ケース７内に回路基板１０を収納して構成される電子ユニットである。この電子ユニットのケース７には、オスコネクタ２を差し込む受け口８を設けてある。その受け口８はケースの内側に貫通しており、回路基板上の回路端に形成される電極パッド１１は、その受け口８の近辺にある。また、受け口８には、突条５の挿入ガイドとなる縦溝９を設けてある。

【００１２】ここでは、その縦溝９に締め代をもたせることにより、オスコネクタ２を受け口に圧入して嵌合終点に固定するようにしている。この圧入による固定であれば、受け口８及びハウジング３の形状のシンプル化が図られるが、嵌合状態の保持手段は、逆止爪とそれを係止させる溝等であってもよい。

【００１３】図示のコネクタは、受け口８と電極パッド１１とによってメスコネクタが構成されており、図１（ｂ）に示すように、オスコネクタ２を受け口８に圧入する。この圧入途中に端子４の先端が回路基板１０に当り、圧入終点で端子４が少し押し上げられて根元の屈曲部に生じる弾性復元力で回路基板１０上の電極パッド１

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１に圧接し、ワイヤーハーネス１と基板上回路の電気接続が完了する。

【００１４】なお、ハウジング３は、端子４を埋設するモールド式のハウジング、ワイヤーハーネス端に取付けた端子を事前に成形したハウジングに取付けるもののどちらであってもよい。図２、図３は後者のタイプのハウジングを用いたオスコネクタであり、図２のそれはランス（かえし）付きハウジング３にワイヤーハーネス端の端子４をハウジングの孔に通して装着し、ランス１２で抜け止めして装着後に端子４を曲げ加工している。また、図３に示すオスコネクタは、曲げ加工後の端子４を、分割型のハウジング３に、ハウジング合わせ面の溝部に挟むようにして装着している。なお、図３では、２分されたハウジングの合わせ状態を弾性係止片１３とその係止片に係合する爪１４とから成る簡易ロック機構によって保持するようにしたが、２分割したハウジングは融着、接着等で、一体化してもよい。また、図４に示すように、分割体をヒンジ１５で連結しておくと、取扱いが楽である。

【００１５】

【発明の効果】以上述べたように、本発明のコネクタは、メスコネクタを電子ユニットのケースと回路基板上の電極とで構成してハウジングと端子から成る単品のメスコネクタを省いたので、コストの低減が図れる。

【００１６】また、オスコネクタの端子を回路基板上の電極に直接接触させるので、電極とコネクタ端子の半田付けによる電気接続も不要になり、結線の簡素化、作業能率の向上等にも効果がある。

【図面の簡単な説明】

【図１】（ａ）：本発明のコネクタの一例を結合を解い＊

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＊た状態にして示す斜視図

（ｂ）：同上のコネクタの結合状態の断面図

【図２】オスコネクタの他の例を示す断面図

【図３】オスコネクタの他の例を示す分割斜視図

【図４】ハウジングの他の例を示す斜視図

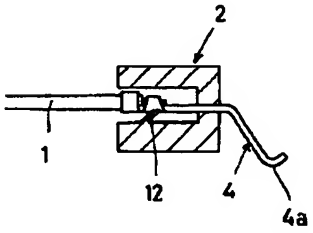
【図５】（ａ）：従来の電気接続例を示す断面図

（ｂ）：同上の接続部に用いられているコネクタの断面図

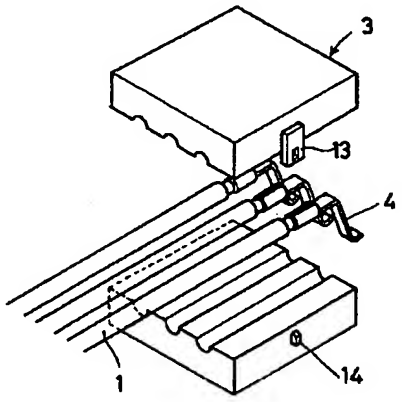
【符号の説明】

１　ワイヤーハーネス
２　オスコネクタ
３　ハウジング
４　端子
４ａ　反り曲げ部
５　突条
６　電子ユニット
７　ケース
８　受け口
９　縦溝
１０　回路基板
１１　電極パッド
１２　ランス
１３　弾性係止片
１４　爪
１５　ヒンジ
２０　オスコネクタ
３０　メスコネクタ
２１、３１　ハウジング
２２、３２　端子

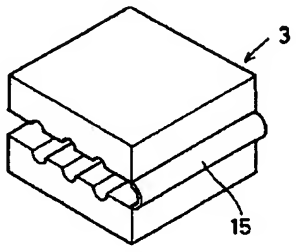
【図２】



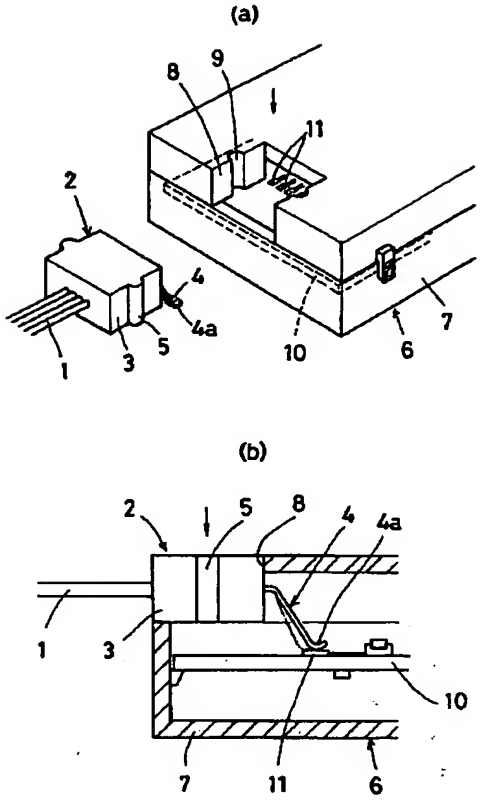
【図３】



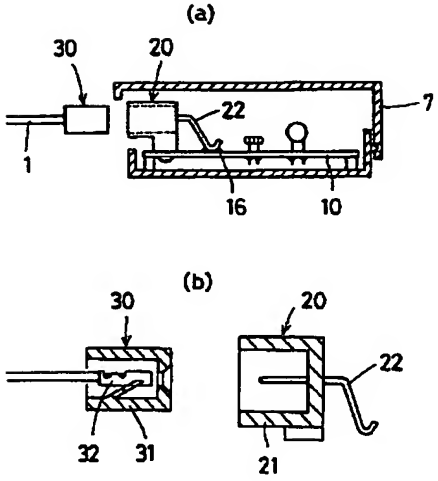
【図４】



【図1】


(a)
8
9
11
2
4
4a
5
1
3
10
6
7
(b)
2
5
8
4
4a
1
3
10
7
11
6

【図5】


(a)
30
20
22
7
1
16
10
(b)
30
20
22
32
31
21